

What is claimed is:

1. A method for gasifying combustibles into a combustible gas by supplying a fluidizing gas to a fluidized-bed furnace and fluidizing a fluidized medium in the fluidized-bed furnace, characterized in that:

a heat recovery region and a combustible region are provided in the fluidized-bed furnace, and the temperature of a fluidized bed or the temperature of a freeboard is controlled so as to be kept at a fixed value by controlling the heat recovery rate by said heat recovery region.

2. A method according to claim 1, characterized in that: said fluidized-bed furnace includes said heat recovery region and said combustion region for gasifying the combustibles, separated by a partition wall, upper and lower portions of said heat recovery region and said combustion region being interconnected;

said combustion region is further divided into first and second areas adjacent to each other;

the fluidizing gas supplied to said fluidized-bed furnace comprises a first fluidizing gas supplied as an upward flow into the furnace from said first area at the furnace bottom, a second fluidizing gas supplied as an upward flow into the furnace from said second area at the furnace bottom, and a heat recovery region fluidizing gas supplied to said heat recovery region;

the mass flow of said first fluidizing gas is smaller than the mass flow of said second fluidizing gas, so that a moving

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bed where the fluidized medium descends and is dispersed is  
formed in said first area and a fluidized bed where the fluidized  
medium is intensely fluidized is formed in said second area, and  
the combustibles supplied to the furnace are gasified into a  
5 combustible gas in said combustion region while circulating  
together with the fluidized medium;

the fluidized medium in said combustion region flows over  
said partition wall into said heat recovery region, and the  
fluidized medium in said heat recovery region is returned from  
10 a lower portion of said partition wall into said combustion  
region; and

the temperature of the fluidized bed or the temperature of  
the freeboard is controlled by adjusting the heat recovery rate  
in said heat recovery region with said heat recovery region  
15 fluidizing gas.

3. A method according to claim 1, characterized in that:  
said fluidized-bed furnace is of a substantially circular  
in horizontal cross-sectional shape, and includes said heat  
20 recovery region at an outer peripheral region and said  
combustion region for gasifying the combustibles at a central  
region, separated by a partition wall, upper and lower portions  
of said heat recovery region and said combustion region being  
interconnected;

25 said combustion region is further divided into a central  
area and a peripheral area;

the fluidizing gas supplied to said fluidized-bed furnace  
comprises a central fluidizing gas supplied as an upward flow

into the furnace from said central region at the furnace bottom,  
a peripheral fluidizing gas supplied as an upward flow into the  
furnace from said peripheral region at the furnace bottom, and  
a heat recovery region fluidizing gas supplied to said heat  
5 recovery region;

one of the mass flow of said central fluidizing gas and the  
mass flow of said peripheral fluidizing gas is smaller than the  
other, so that a moving bed where the fluidized medium descends  
and is dispersed is formed in one of said central and peripheral  
10 areas of the furnace and a fluidized bed where the fluidized  
medium is intensely fluidized is formed in the other of said  
central and peripheral areas of the furnace, and the  
combustibles supplied to the furnace are gasified into a  
combustible gas while circulating together with the fluidized  
15 medium;

the fluidized medium in said combustion region flows over  
said partition wall into said heat recovery region, and the  
fluidized medium in said heat recovery region is returned from  
a lower portion of said partition wall into said combustion  
20 region; and

the temperature of the fluidized bed or the temperature of  
the freeboard is controlled by adjusting the heat recovery rate  
in said heat recovery region with said heat recovery region  
fluidizing gas.

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4. A method according to claim 2, characterized in that:  
temperature control in said fluidized-bed furnace  
comprises temperature control in said combustion region with

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said first fluidizing gas and said second fluidizing gas and temperature control in said heat recovery region, and the temperature control in said combustion region is main temperature control and the temperature control in said heat recovery region is auxiliary temperature control.

5        5.    A method according to claim 2, characterized in that:  
         temperature control in said fluidized-bed furnace comprises temperature control in said combustion region with  
10    said first fluidizing gas and said second fluidizing gas and temperature control in said heat recovery region, and the temperature control in said combustion region is auxiliary temperature control and the temperature control in said heat recovery region is main temperature control.

15        6.    A method according to claim 3, characterized in that:  
         temperature control in said fluidized-bed furnace comprises temperature control in said combustion region with  
20    said central fluidizing gas and said peripheral fluidizing gas and temperature control in said heat recovery region, and the temperature control in said combustion region is main temperature control and the temperature control in said heat recovery region is auxiliary temperature control.

25        7.    A method according to claim 3, characterized in that:  
         temperature control in said fluidized-bed furnace comprises temperature control in said combustion region with  
         said central fluidizing gas and said peripheral fluidizing gas

and temperature control in said heat recovery region, and the temperature control in said combustion region is auxiliary temperature control and the temperature control in said heat recovery region is main temperature control.

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8. A method for gasifying combustibles into a combustible gas by supplying a fluidizing gas to a fluidized-bed furnace and fluidizing a fluidized medium in the fluidized-bed furnace, characterized in that:

10 the fluidized-bed furnace is controlled so that the fluidized bed temperature or the freeboard temperature is controlled so as to be kept at a predetermined value;

a combustible gas and fine particles generated in said fluidized-bed furnace is delivered from said freeboard above  
15 said fluidized bed to a melt combustion furnace; and

said combustible gas and said fine particles in said melt combustion furnace are combusted or gasified and ash is melted.

9. A fluidized-bed gasifying apparatus for gasifying  
20 combustibles, characterized in that:

a fluidized-bed furnace has at a bottom thereof an air diffusion device for ejecting fluidizing air upwardly under a mass flow that is at least greater at one side than a mass flow at another side;

25 said fluidized-bed furnace includes a heat recovery region and a combustion region for gasifying the combustibles, separated by a partition wall, upper and lower portions of said heat recovery region and said combustion region being

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interconnected;

a heat transfer surface is provided in said heat recovery region for using a heating medium therein, a heat recovery region air diffuser being provided at said heat recovery region bottom;

5 in said combustion region, the amount of air ejected from said air diffusion device is controlled to form a moving bed where the fluidized medium descends and is dispersed above an area where the air is ejected under the smaller mass flow, and to form a fluidized bed where the fluidized medium is intensely  
10 fluidized and moves toward an upper part of said moving bed above an area where the air is ejected under the greater mass flow, thereby forming a circulating fluidized bed; and

said heat recovery region is connected to said combustion region through above and below said partition wall for allowing  
15 a portion of the fluidized medium to flow over an upper end of said partition wall into said heat recovery region, and the amount of air ejected from said heat recovery region air diffuser is controlled to cause the fluidized medium in said heat recovery region to descend as a moving bed and thereafter to circulate  
20 from a connecting opening below said partition wall to said combustion region.

10. A fluidized-bed gasifying apparatus for gasifying combustibles, characterized in that:

25 a fluidized-bed furnace having a substantially circular horizontal cross-sectional shape has an air diffusion device for ejecting fluidizing air upwardly under a mass flow that is at least greater at one of central and peripheral furnace bottom

than a mass flow at the other of said central and peripheral furnace bottoms;

said fluidized-bed furnace includes a heat recovery region and a combustion region for gasifying the combustibles, separated by a partition wall, upper and lower portions of said heat recovery region and said combustion region being interconnected;

a heat transfer surface is provided in said heat recovery region for using a heating medium therein, a heat recovery region air diffuser being provided at a bottom of said heat recovery region bottom;

the amount of air ejected from said air diffusion device is controlled to form a moving bed where the fluidized medium descends and is dispersed above an area where the air is ejected at the smaller mass flow in said combustion region, and to form a fluidized bed where the fluidized medium is intensely fluidized and moves toward an upper part of said moving bed above an area where the air is ejected with the greater mass flow, thereby forming a circulating fluidized bed; and

said heat recovery region is connected to said combustion region above and below said partition wall for allowing a portion of the fluidized medium to flow over an upper end of said partition wall into said heat recovery region, and the amount of air ejected from said heat recovery region air diffuser is controlled to cause the fluidized medium in said heat recovery region to descend as a moving bed and thereafter to circulate from a connecting opening below said partition wall to said combustion region.

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